WHAT IS CLAIMED IS:

1. A magnetic azimuth measurement apparatus comprising:

magnetic detection means having two or more magnetic detection devices with directionality, the magnetic detection devices being disposed at equal intervals based on a predetermined rule in such a way that directionalities thereof are different from each another;

sampling means for sequentially switching and sampling electromagnetic conversion outputs of magnetic detection devices of the magnetic detection means;

condition determining means for determining whether or not the electromagnetic conversion output being sequentially switched and sampled by the sampling means meets a predetermined condition; and

azimuth information output means for outputting magnetic azimuth information based on a result of the determination of the condition determining means.

2. The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the magnetic detection means comprises the magnetic detection devices disposed at equal intervals on a circumference of a circle or a polygon.

3. The magnetic azimuth measurement apparatus according to Claim 2, wherein:

the magnetic azimuth device of the magnetic detection means comprises a magnetic core made of a soft magnetic material, an excitation coil for exciting thereof, and a detection coil for detecting an external magnetic field.

4. The magnetic azimuth measurement apparatus according to Claim 3, wherein:

in the magnetic detection means, one loop-shape magnetic core is shared by all of the magnetic detection devices.

5. The magnetic azimuth measurement apparatus according to Claim 4, wherein:

in the magnetic detection means, one excitation coil is shared by all of the magnetic detection devices.

6. The magnetic azimuth measurement apparatus according to Claim 5, wherein:

in the magnetic detection means, all the magnetic detection coils have the same one end.

7. The magnetic azimuth measurement apparatus according to Claim 3, 4, 5 or 6, wherein:

the magnetic detection device of the magnetic detection means is fabricated by forming on a non magnetic substrate the magnetic core of a loop-shape, an excitation coil and a detection coil with the use of a thin film processing.

8. The magnetic azimuth measurement apparatus according to Claim 7, wherein:

the excitation coil and detection coil are formed with a two-layer structure.

9. The magnetic azimuth measurement apparatus according to Claim 3, 4, 5, 6 or 7 wherein:

the magnetic core comprises a material that enable provision and elimination of inductive magnetic anisotropy to be carried out with heat treatment in a magnetic field.

10. The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the sampling means switches electromagnetic conversion outputs of the magnetic detection devices, and performs synchronous detection of a switched signal with a predetermined frequency, thereby sampling a voltage change corresponding to an external magnetic strength.

11. The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the sampling means sequentially operates switches in response to a signal from a binary counter if the number of detection coils of the magnetic detection devices is set to be 2^n, the number of the switches being the same as that of the detection coils.

12. The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the condition determining means supplies a trigger signal to the azimuth information output means as a result of determination if the electromagnetic output being sequentially sampled by the sampling means is a maximum, a minimum, or zero crossing.

13. The magnetic azimuth measurement apparatus according to Claim 12, wherein:

the azimuth information output means outputs a signal for switching, which is sampled by the sampling means if the trigger signal is received from the condition determining means, as information indicating an azimuth of the external magnetic field.

14. A magnetic azimuth measurement apparatus comprising:

a magnetic detection unit having two or more magnetic detection devices with directionality, the magnetic detection devices being disposed at equal intervals based on a predetermined rule in such a way that directionalities thereof are different from each another;

a sampling unit for sequentially switching and sampling electromagnetic conversion outputs of magnetic detection devices of the magnetic detection means;

a condition determining unit for determining whether or not the electromagnetic conversion output being sequentially switched and sampled by the sampling means meets a predetermined condition; and

a azimuth information output unit for outputting magnetic azimuth information based on a result of the determination of the condition determining means.